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along a line 400 miles in length. "They do not break out from bluffs or fall in cascades, but appear as pools, often in the level prairie. . . . The pools are carpeted with exquisite water-plants, forming a waving mass in which may be seen many fishes. So transparent and crystalline are these waters, that objects 15 to 20 feet below the surface appear only a foot away. No tint of surface *débris* or of storm sediment mars the crystal clearness, for they are purified by rising through nature's filter, a thousand feet of the earth's strata." These are natural artesian wells, the water being forced from the ground by hydrostatic pressure acting from many miles away. In his summing-up of the Grand Prairie, Professor Hill remarks: "I drove during the great drought of 1877 from Decatur to Fort Worth [about 50 miles] over a rich, grass-clad region, without being able to secure a drop of water for myself or team the entire distance, while dozens of suffering teamsters were begging and trying to buy water from the owners of the few and all but exhausted surface wells along the way. With the knowledge now before us, every foot of that vast area of the Grand Prairie, being underlaid by water, could be cut into 40-acre tracts, upon each of which, if flowing water could not be obtained, magnificent negative wells rising nearly to the surface could be obtained, furnishing an abundance of waters unaffected by drought."

The "red beds" of Oklahoma, Texas, and New Mexico occupy an area of about 100,000 square miles and receive their name from the color of the rocks, "glaring vermilion or deep-brown chocolate sometimes prevailing, varied only here and there by a bed of snow-white gypsum." The principal area is about 350 miles long by an average of 150 miles wide. The whole series is considered to be "probably a single unbroken formation, representing the sediments of an ancient inland sea." This country is not favorable for the finding of artesian water, although a few surface wells occur at intervals. The Llano Estacado is a plain of about 50,000 square miles area, nearly level, unbroken by trees or bushes, and unseamed by water-channels. Its name is from

the Spanish, meaning a wall or palisade, and is derived from the fact that there is a steep and abrupt declivity on all sides but that toward the south-east. It is practically without surface water, there being only a single running stream throughout its whole extent, and this has a length of only about 10 miles, when it is swallowed up in the earth. The cause is found in the porosity of the soil which allows the rain to soak into it immediately. This circumstance, however, is favorable for securing water by wells, and accordingly it is found that wherever they have been dug, water has been found. With water upon its surface, the sterile character of the great Llano will soon be a thing of the past.

We cannot go further into the details of Professor Hill's report here, but must content ourselves with saying that it is to be hoped it may be published in some more accessible form than in a government document that is limited to an edition of less than 1,500 copies.

The report of Professor L. E. Hicks deals mainly with the conditions in Nebraska, and we have an account of the geological structure of the State as related to underground waters. He also considers the irrigable lands and gives an interesting account of the Loup Valley, which lies on the borders of the humid and the arid regions, where rainfall is sometimes abundant and again scanty. It becomes, therefore, a matter of great practical moment to ascertain the possibility of irrigating the land. This can only be done in the valleys, the rest of the country being cut and scarred in a peculiar and intricate way. The capacity of the Loup River for irrigation is limited to about 1,000,000 acres of land, and, as it happens, this is also the amount of land that is capable of irrigation. The last report in the volume is by Professor G. E. Culver, who treats of the artesian wells of the Dakotas.

Part IV. of this report is by J. M. Gregory and F. F. B. Coffin. The part written by the former is general in its character and treats of the conditions in western Nebraska, Kansas, and Okla-

Publications Received at Editor's Office.

- ANDREWS, EDMUND AND ANDREWS, E. W. Rectal and Anal Surgery. 3d ed. Chicago, W. T. Keener. 164 p. 8°. 80c.
- BROWN, J. C. People of Finland in Archaic Times. London, Kegan Paul, Trench, Trubner & Co. 290 p. 12°. 12c.
- CROTHERS, SAMUEL MCHORD. Members of One Body. Boston, Geo. H. Ellis. 132 p. 12°. 75 cts.
- FOOTE, HENRY W. The Insight of Faith. Boston, Geo. H. Ellis. 115 p. 24°. 50 cts.
- HINCKLEY, F. A. Afterglow. Boston, Geo. H. Ellis. 81 p. 24°. 50 cts.
- HOPKINSON, JOHN. Original Papers on Dynamo Machinery and Allied Subjects. New York, W. J. Johnston Co. 249 p. 12°. 12c.
- HOUSTON, E. J. Electricity and Magnetism, being a Series of Advanced Primers of Electricity. New York, W. J. Johnston Co. 306 p. 12°. 12c.
- JAMIESON, ANDREW. Applied Mechanics. Philadelphia, Lippincott. 268 p. 12°. \$1.25.
- LYDSTON, G. FRANK. Varicocele and its Treatment. Chicago, W. T. Keener. 126 p. 8°.
- MAGNUS, SIR PHILIP. Lessons in Elementary Mechanics. New edition. London and New York, Longmans, Green & Co. 371 p. 12°. \$1.20.
- MARTIN, F. H. Electricity, Diseases of Women and Obstetrics. Chicago, W. T. Keener. 252 p. 8°.
- MAYCOCK, W. PERREN. Electric Lighting and Power Distribution. Part I. New York, Macmillan. 185 p. 12°. 75 cts.
- MINCHIN, GEO. M. Hydrostatics and Elementary Hydrokinetics. New York, Macmillan. 424 p. 12°. \$2.60.
- MITCHELL, CLIFFORD. A Clinical Study of Diseases of the Kidneys. 2d ed. Chicago, W. T. Keener. 431 p. 8°.
- POYSER, A. W. Magnetism and Electricity. London and New York, Longmans, Green & Co. 382 p. 12°. \$1.50.
- SAVAGE, M. J. The Evolution of Christianity. Boston, Geo. H. Ellis. 178 p. 12°. \$1.
- TOWNSEND, C. H. TYLER. N. A. Genera of Calyptrate Muscidae; N. A. Tachinidae; New Jamaica Tachinidae; Mexican Species of Ceroplastes; Leaf-miner of Populus Fremonti. Reprints. Las Cruces, N. M., The Author.
- VILLEMAIN, M. Souvenirs des Cent Jours. Ed. by G. Sharp. New York and London, Longmans, Green & Co. 188 p. 12°. 75 cts.

Reading Matter Notices.

Ripans Tabules: best liver tonic.
Ripans Tabules cure jaundice.

CALENDAR OF SOCIETIES.

Anthropological Society, Washington.

Dec. 13.—Place-Names in the District of Columbia; Symposium; Discussion of Report of Special Committee; communications, W. J. McGee, On Principles of Nomenclature; O. T. Mason and Edward Goodfellow, On the General Subject.

Agassiz Club, Corvallis, Ore.

Nov.—F. L. Washburn, Oökinesis in Limax and Arbacia, prefacing the paper with illustrated remarks on karyokinetic phenomena in general. The paper set forth the results of some personal observations on living and sectioned eggs.

Fact and Theory Papers

I. THE SUPPRESSION OF CONSUMPTION. By GODFREY W. HAMBLETON, M.D. 12°. 40c.

II. THE SOCIETY AND THE "FAD." By APPLETON MORGAN, Esq. 12°. 20 cents.

III. PROTOPLASM AND LIFE. By C. F. COX. 12°. 75 cents.

IV. THE CHEROKEES IN PRE-COLUMBIAN TIMES. By CYRUS THOMAS. 12°. \$1.

V. THE TORNADO. By H. A. HAZEN. 12°. \$1.

VI. TIME-RELATIONS OF MENTAL PHENOMENA. By JOSEPH JASTROW. 12°. 50c.

VII. HOUSEHOLD HYGIENE. By MARY TAYLOR BISSELL. 12°. 75 cents.

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874 Broadway, New York.

FOSSIL RESINS.

This book is the result of an attempt to collect the scattered notices of fossil resins, exclusive of those on amber. The work is of interest also on account of descriptions given of the insects found embedded in these long-preserved exudations from early vegetation.

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homa, and eastern Colorado. Coffin's short report deals with the Dakota artesian basin and contains little of value.

The papers mentioned last in our title are the irrigation bulletins of the Census Office. These have been prepared by Mr. F. H. Newell, special agent on irrigation, and they cover nearly all the territory in which irrigation has been or may be practised, except California and Nevada, and these States are under consideration. In these bulletins we have accounts of what has been done in the separate States, together with a general outline of the physical conditions. One of them is devoted to artesian wells, and in it mention is made of the various artesian areas of the States. The latest of the series is largely statistical in its character and contains four maps of the country west of the 97th meridian, upon which are shown the irrigated areas, the size of crops produced by irrigation, the proportion of irrigated land to the whole, and finally the average size of the irrigated crop holdings in various sections. This notice is already too long to enter into the details of these bulletins: we can only commend them to those making a study of this important subject.

The diverse origin and character of the publications treated of in this notice, all of them, however, emanating from the general government, cannot fail to give rise to some thought. It is observed that the Geological Survey, the Weather Bureau, the Irrigation Inquiry Branch of the Department of Agriculture, and the Census Office are all concerned in their production. It is true that the Weather Bureau is now an integral part of the Department of Agriculture, but it was not when the report in question was issued. There are, then, three separate departments of the government concerned with this work. Where it is thus divided there is certain to be more or less duplication. It will be remembered that when the surveys of our western territory under Hayden, Wheeler, and Powell were being carried on, there was a continual clash and more or less repetition. When they were finally consolidated under one head, this duplication was done away with and the work executed with equal thoroughness.

If, now, the various offices investigating the irrigation question were consolidated under one management, the danger of duplication, and the expenditure of money twice over for the same work would be avoided. The intimate connection between the matter of irrigation and the agriculture of the country shows the advisability of placing it under the control of the Secretary of Agriculture. There has already emanated from that department one of the most valuable of recent reports. The connection of the Weather Bureau would facilitate the collection of rainfall and temperature statistics; and the establishment of a Bureau of Irrigation with a corps of irrigation experts, all under the control of one head, would give in the end far better results than can be expected from the diverse character the work now presents. The U. S. Geological Survey and the Census Office are collecting statistics of rainfall, estimating the flow of streams or studying the relations of soil to climate. These may properly be regarded as the work of the Weather Bureau. So, too, when the irrigation inquiry of the Department of Agriculture was in existence, it duplicated portions of the work of the Geological Survey. The time now seems ripe for a consolidation of the various irrigation inquiries. The headquarters of this Bureau of Irrigation seems by right to be the Department of Agriculture.

JOSEPH F. JAMES.

AMONG THE PUBLISHERS.

A CURIOUS undertaking, entitled "The Scientific Roll; and Magazine of Systematized Notes," has been conducted for some years by Alexander Ramsay of London. Three parts concerning meteorology are before us, with sub-title, "Climate: Baric Condition." These are occupied by a bibliography from 1688 to 1850, apparently not complete, extended abstracts from antiquated authors, and an injudicious essay by the author on "Why does the Barometer Rise and Fall?" The author's industry is praiseworthy, but the results of his industry do not seem to us of high value to modern students.

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For sale.—A set of the *Berichte der Deutschen Chemischen Gesellschaft*, from Jan. 1, 1877, to Jan. 1, 1892, bound in twenty-six volumes to Jan. 1, 1888 and remaining four years unbound. Also the *Bulletin de la Société Chimique de Paris*, from Jan. 1, 1879, to Jan. 1, 1892, bound in eighteen volumes to Jan. 1, 1888, and remaining four years unbound. Dr. Marcus Benjamin, care of D. Appleton & Co., 1 Bond St., New York City.

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For Sale.—A new Model U. S. Army Hospital Microscope (Zentmayer), also $\frac{1}{2}$ -inch and $\frac{1}{4}$ -inch Objectives. HENRY C. WELLS, 151 Broadway, New York.

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